WHAT IS CLAIMED IS:

1. A system for providing a control signal to control an excitation level of an alternator, the system comprising:

a first calculation element that receives first, second and third indications of first, second and third output voltages of first, second and third phases of the alternator, respectively, and calculates a first feedback signal in dependence upon the received first, second and third indications;

a second calculation element that receives the first indication and calculates a second feedback signal in dependence upon the received first indication;

an intermediate signal generation element that receives a target input and the first feedback signal, and in response provides an intermediate signal; and

a control signal generation element that receives the intermediate signal and the second feedback signal, and in response provides the control signal.

2. The system of claim 1, in which the first feedback signal is calculated at least every 100 milliseconds, and the second feedback signal is calculated at least every 10 milliseconds.

3. The system of claim 1, wherein the first calculation element calculates first, second and third RMS voltages corresponding, respectively, to the first, second and third output voltages during a first time period, and further calculates the first feedback signal as being related to an average of the first, second and third RMS voltages;

wherein the second calculation element calculates the second feedback signal as being related to a fourth RMS voltage corresponding to the first output voltage during a second time period; and

wherein the first time period is longer than the second time period.

4. The system of claim 3,

wherein the system is configured to receive the output voltages of an alternator that is in at least one of a wye configuration, a delta configuration, a single-phase configuration, a dog-leg configuration, a zig-zag configuration, and a double delta configuration;

wherein, when the alternator is in the delta configuration, the indications of the first, second and third output voltages are, respectively, an indication of a voltage difference between the output voltages of a first terminal and a second terminal of the alternator, an indication of a voltage difference between the output voltages of the second terminal and a third terminal of the alternator, and an indication of a voltage difference between the output voltages of the third and the first terminals of the alternator; and

wherein, when the alternator is in the wye configuration, the indications of the first, second and third output voltages are indications of voltage differences between at least one of a neutral point and a ground of the alternator and, respectively, the output

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voltages of a first terminal, a second terminal and a third terminal of the alternator.

5. The system of claim 1, wherein the intermediate signal generation element includes a first comparing element that receives the target input and the first feedback signal, and in response provide a first comparison signal, and a first control element that provides the intermediate signal in response to the first comparison signal; and

wherein the control signal generation element includes a second comparing element that receives the intermediate signal and the second feedback signal, and in response provides a second comparison signal, and a second control element that provides the control signal in response to the second comparison signal.

6. The system of claim 5,

wherein each of the comparing elements is a differencing junction.

7. The system of claim 5,

wherein each of the control elements is at least one of a proportional-integral (PI) controller, a proportional (P) controller, and a proportional-integral-differential (PID) controller.

8. The system of claim 5,

wherein all of the calculation, comparing, and control elements are included within a genset controller.

9. The system of claim 8, wherein each of the calculation, comparing and control elements are embodied in software within the genset controller.

10. The system of claim 9,

wherein each of the calculation elements is embodied within a real time math subsystem software routine, and each of the comparing and control elements is embodied within at least one of a voltage regulator subsystem software routine and a metering subsystem software routine.

11. The system of claim 10,

wherein the first and second calculation elements are respectively called to perform their respective operations by at least one of the voltage regulator subsystem software routine and the metering subsystem software routine every 100 milliseconds and 10 milliseconds, respectively.

12. The system of claim 1,

wherein the target input is a constant value of 1200.

13. The system of claim 1, wherein the first calculation element calculates first, second and third DC-equivalent voltages corresponding, respectively, to the first, second and third output voltages during a first time period, and further calculates the first feedback signal as being related to an average of the first, second and third DC-equivalent voltages;

wherein the second calculation element calculates the second feedback signal as being related to a fourth DC-equivalent voltage corresponding to the first output voltage during a second time period; and

wherein each DC-equivalent voltage is equal to at least one of a time-average voltage and a peak voltage value.

14. The system of claim 1, wherein the first calculation element calculates the first feedback signal based upon the first, second and third output voltages provided during 3 cycles of the alternator, and wherein the second calculation element calculates the second feedback signal based upon the first output voltage provided during a half cycle of the alternator.

15. A system for providing a control signal to control an excitation level of an alternator, the system comprising:

an outer loop means for providing a first control signal component based upon a plurality of output voltage indications from the alternator; and

an inner loop means for providing a second control signal component based upon at least one of the plurality of output voltage indications from the alternator;

wherein, the second control signal component provided by the inner loop means is updated at a more frequent rate than the first control signal component provided by the outer loop means.

16. A method of controlling an excitation level of an alternator, the method comprising:

receiving first, second and third indications of first, second and third output voltages of first, second and third phases of the alternator, respectively;

calculating a first feedback signal in dependence upon the received first, second and third indications;

calculating a second feedback signal in dependence upon the received first indication;

determining an intermediate signal in response to a target input and the first feedback signal;

determining a control signal in response to the intermediate signal and the second feedback signal; and

controlling the excitation level of the alternator in response to the control signal.

17. The method of claim 16, wherein the first feedback signal is calculated at least every 100 milliseconds, and the second feedback signal is calculated at least every 10 milliseconds.

18. The method of claim 16, wherein the calculating of the first feedback signal includes calculating first, second and third DC-equivalent voltages corresponding, respectively, to the first, second and third output voltages during a first time period;

wherein the calculating of the second feedback signal includes calculating a fourth DC-equivalent voltage corresponding to the first output voltage during a second time period; and

wherein each DC-equivalent voltage includes at least one of a RMS voltage, a time-average voltage, and a peak voltage.

19. The method of claim 16, wherein the determining of the intermediate signal includes determining a first comparison signal in response to the target input and the first feedback signal, and generating the intermediate signal in response to the first comparison signal; and

wherein the determining of the control signal includes determining a second comparison signal in response to the intermediate signal and the second feedback signal, and generating the control signal in response to the second comparison signal.

20. The method of claim 19, wherein each of the intermediate signal and the control signal is generated by at least one of a proportional (P) controller, a proportional-integral (PI) controller, and a proportional-integral-differential (PID) controller.

21. The method of claim 19, wherein each of the first and second comparison signals is determined by a respective differencing junction.

22. The method of claim 16, wherein the first, second and third indications are provided to a genset controller, the first and second feedback signals are calculated by software within the genset controller, the first and second comparison signals are determined by the software, and the intermediate signal and the control signal are generated by the software, wherein the genset controller outputs the control signal at an output port for transmission to the alternator.

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